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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,475	04/21/2004	Yoshihisa Dotta	1035-506	7094
23117	7590	01/11/2005	EXAMINER	
NIXON & VANDERHYE, PC 1100 N GLEBE ROAD 8TH FLOOR ARLINGTON, VA 22201-4714			NADAV, ORI	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/828,475

Applicant(s)

DOTTA ET AL

Examiner

ori nadav

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 10-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/21/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of claims 1-9 in the reply filed on 11/01/2004 is acknowledged.

Specification

The disclosure is objected to because of the following informalities: The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5-6 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claimed limitations of a penetration electrode including an insulating film, as recited in claims 5 and 8, are unclear as to how an electrode can include an insulating film since an electrode is known in the art as a conductive film.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2 and 5-9, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 102(b) as being anticipated by Finnila (5,426,072).

Finnila teaches in figure 6 and related text a semiconductor apparatus, comprising:

a semiconductor substrate 29, 11, 12;

a field oxide film 13 formed in a surface of the semiconductor substrate, the field oxide film having an aperture section;

an electrode 23 formed on the field oxide film; and

a penetration electrode 21 electrically connected to the electrode via the aperture

section of the field oxide film and via a hole formed in the semiconductor substrate,

the hole being formed in the aperture section of the

field oxide film, when perpendicularly viewing the semiconductor substrate.

wherein the penetration electrode is formed in a field area of the surface of the semiconductor substrate,

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wherein the penetration electrode includes an insulating film 15 (see figure 4) formed on an internal surface of the hole,

wherein the penetration electrode includes an electrically conductive film 16 on the insulating film that is formed on the internal surface of the hole,

wherein the penetration electrode includes a hole-filling section formed in the hole,

wherein the hole-filling section is made of an insulating material and of an electrically conductive material.

Claims 1-9, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 102(b) as being anticipated by Fechner et al. (6,576,508).

Fechner et al. teach in figure 3 and related text a semiconductor apparatus, comprising:

a semiconductor substrate 104, 102;

a field oxide film 106 formed in a surface of the semiconductor substrate, the field oxide film having an aperture section;

an electrode 118 formed on the field oxide film; and

a penetration electrode 114 electrically connected to the electrode via the aperture section of the field oxide film and via a hole formed in the semiconductor substrate,

the hole being formed in the aperture section of the

field oxide film, when perpendicularly viewing the semiconductor substrate.

wherein the penetration electrode is formed in a field area of the surface of the semiconductor substrate,

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wherein the penetration electrode includes an insulating film 116 formed on an internal surface of the hole,

wherein the penetration electrode includes an electrically conductive film on the insulating film that is formed on the internal surface of the hole,

wherein the penetration electrode includes a hole-filling section formed in the hole,

wherein the hole-filling section is made of an insulating material and of an electrically conductive material.

Regarding claims 3 and 4, Fechner et al. teach in figure 8 and related text an electrode 122 formed on the field oxide film (on the sidewall of the field oxide film); and a penetration electrode 114 electrically connected to the electrode via the aperture section (this passage address the limitations of claim 1), wherein

the electrode 122 has an aperture section, the penetration electrode 114 is connected to said electrode in the aperture section of the electrode, wherein the aperture section of the field oxide film is formed in the aperture section of the electrode, when perpendicularly viewing the semiconductor substrate.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Finnila.

Finnila teaches substantially the entire claimed structure, as applied to claim 1 above, except the electrode has an aperture section, the penetration electrode is connected to said electrode in the aperture section of the electrode.

Finnila teaches in figure 9 an electrode 18' has an aperture section, the penetration electrode 21' is connected to said electrode in the aperture section of the electrode, wherein the aperture section of the field oxide film is formed in the aperture section of the electrode, when perpendicularly viewing the semiconductor substrate.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form Finnila's electrode with an aperture section, wherein the penetration electrode is connected to said electrode in the aperture section of the electrode, and wherein the aperture section of the field oxide film is formed in the aperture section of the electrode, when perpendicularly viewing the semiconductor substrate in order to use and operate the device in the manner taught by Finnila.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References C-F are cited as being related to through holes.

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Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to *Examiner Nadav* whose telephone number is (571) 272-1660. The Examiner is in the Office generally between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is 308-0956



O.N.
1/8/05

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PRIMARY EXAMINER
TECHNOLOGY CENTER 2800